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Objektyp: **Article**

Zeitschrift: **Mitteilungen der Schweizerischen Entomologischen Gesellschaft = Bulletin de la Société Entomologique Suisse = Journal of the Swiss Entomological Society**

Band (Jahr): **86 (2013)**

Heft 1-2

PDF erstellt am: **25.09.2024**

Persistenter Link: <https://doi.org/10.5169/seals-403057>

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Nebria (Asionebria) mentoincisa sp. n., a new alpine ground beetle species from the Transhimalaya of South Tibet (Coleoptera, Carabidae)

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Nebria (Asionebria) mentoincisa sp. n. is described from Kurum Valley, NW Lhasa, South Central Tibet (China).

Keywords: Coleoptera, Carabidae, *Nebria*, *Asionebria*, taxonomy, new species, Tibet, China.

INTRODUCTION

The subgenus *Asionebria* of the genus *Nebria* Latreille, 1802 comprised three species when Shilenkov (1982) established it: the type species *N. roborowskii* Semenov, 1889, *N. hiekei* Shilenkov, 1982, and *N. nanshanica* Shilenkov, 1982. Redefining the subgenus, Ledoux & Roux (2005) transferred *N. nanshanica* to the subgenus *Eunebria* Jeannel, 1937. At the same time they added the following taxa to *Asionebria*: *N. orientalis* Bänninger, 1949, *N. unguinosa* Ledoux, Roux & Sciaky, 1994, *N. pharina* Andrewes, 1929, and *N. pharina walteriana* Ledoux & Roux, 1997. At the moment the subgenus *Asionebria* consists of six taxa.

All *Asionebria* taxa are restricted to the southern and eastern parts of the Tibetan Plateau from the northern face of the Himalaya to the Nan Shan (Qilian Shan) at the Qinghai-Gansu border. All species are adapted to high altitude habitats between 3500 m and 5000 m (Ledoux & Roux 2005).

In order to search for the locations of last glaciation refugia of the alpine arthropod fauna of the Tibetan Plateau the junior author visited the central parts of the Tibetan Himalaya and Transhimalaya as well as the southern Chang Tang between 2007 and 2011. During these research trips, a huge number of local endemic ground beetle species were detected, e.g. in the genus *Trechus* Clairville, 1806 (Schmidt 2009). In addition, two populations of an obviously new *Nebria* species of the subgenus *Asionebria* were discovered in the uppermost parts of two glacier formed side valleys of the Kurum Valley in the Transhimalaya northwest of Lhasa. The new species is described below.

MATERIAL AND METHODS

The specimens of the new species were compared with the *Asionebria* species stored in the collection of the NMBE which comprises all taxa of the subgenus with the

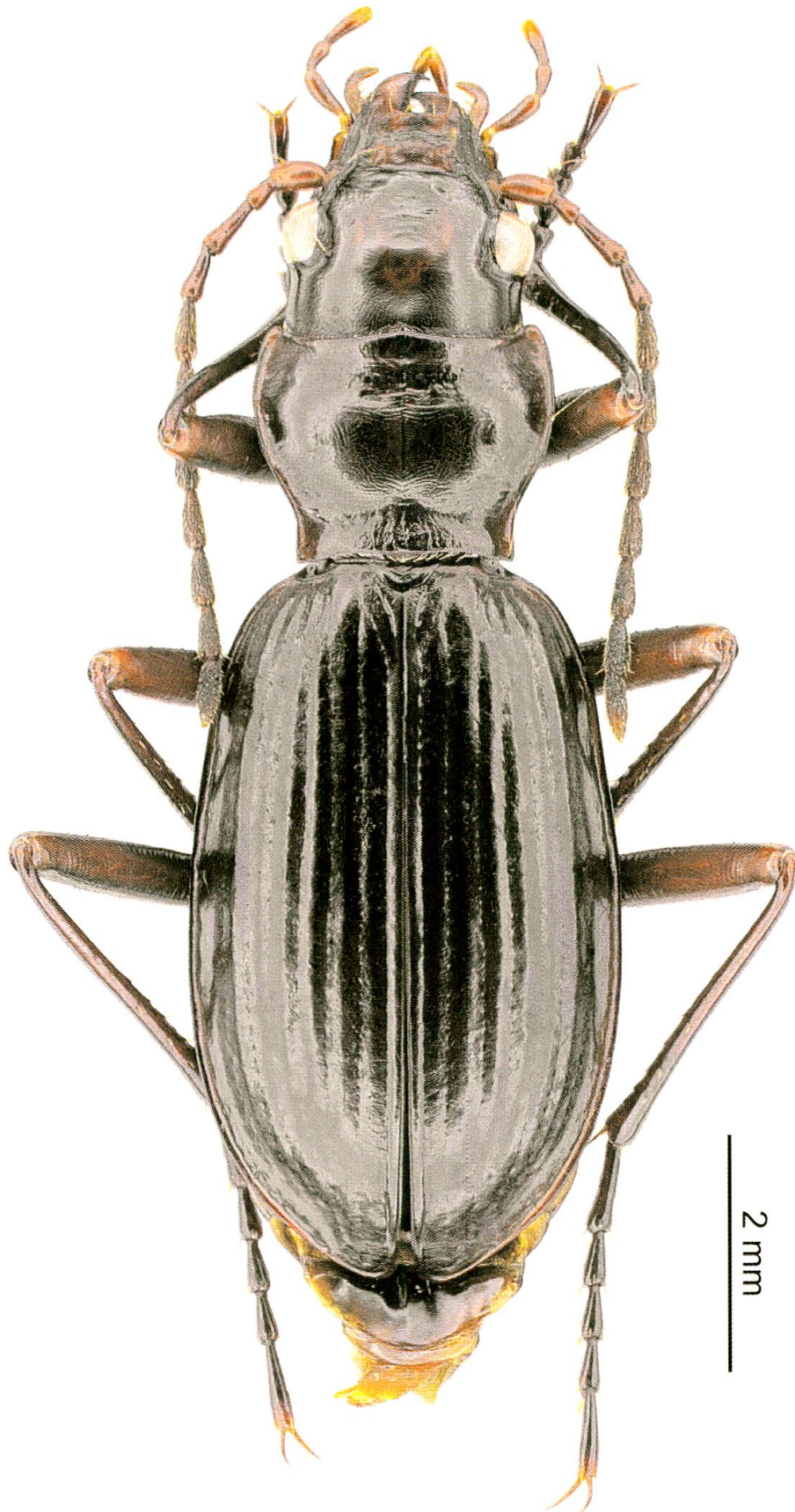


Fig. 1: Habitus of *Nebria (Asionebria) mentoincisa* sp. n., male paratype.

exception of *N. hiekei* Shilenkov, 1982. Additionally, the type series of *N. orientalis* of the Bänninger collection (ETHZ) was available.

Abbreviations used:

- CSCHM coll. Joachim Schmidt, Admannshagen, Germany
ETHZ Eidgenössische Technische Hochschule Zürich, Switzerland (coll. Bänninger)
NMBE Naturhistorisches Museum der Burggemeinde Bern, Switzerland

The micro-photographs were taken with Leica M205-C stereomicroscope and Leica DFC450 digital camera using a motorised focussing drive, light base Leica TL5000 Ergo, diffused light with Leica hood LED5000 HDI, subsequently processed with Leica LAS application software, and enhanced with CorelDRAW Graphics Suite X5.



Fig. 2: Mentum of *Nebria (Asionebria) mentoincisa* sp. n., male paratype.

TAXONOMY

***Nebria (Asionebria) mentoincisa* sp. n.**

(Figs 1, 2, 3A, 4)

Diagnosis: *N. mentoincisa* sp. n. differs from all *Asionebria* species by the medially deeply incised mentum, by the stout tarsi and by the ventral hairy tuft of only pro-tarsomeres 1–2 in the males and by the apically thickened median lobe. *N. mentoincisa* sp. n. is the largest of all *Asionebria* species.

Type material. Holotype ♂: Tibet (South Central) 29.6.2007 / Dulong, Kurum vall., NW Lhasa / 4900–5200 m, leg. Schmidt / ca. 29°42'18 N, 90°35'16 E // south ascent of / Tsubu side valley / above Tsurphu Monastery (NMBE).

Paratypes: 8 ♂♂, 11 ♀♀, same data as holotype (NMBE, CSCHM); 3 ♂♂, 5 ♀♀, Tibet (South Central) 28.6.2007 / Dulong, Kurum vall., NW Lhasa / 4900–5150 m, leg. Schmidt / ca. 29°40'31 N, 90°45'16 E // Namba side valley / ascent south west / Namba (CSCHM); 28 ♂♂, 31 ♀♀, S Tibet, 27.6.2011 / Kurum Vall. S Nampa [= Namba] side / vall., 5100–5350 m, lg. Schmidt / 29°40'16 N, 90°45'48 E (NMBE, CSCHM).

Description. Body size: 9.5–11 mm.

Colour brown to dark brown, appendages of the head brownish lightened. Head with two indistinct lightened spots on the vertex. Antennae black, antennomeres 1–4 brown. Elytral suture occasionally lightened.

Head large. Neck large. Eyes moderately protruding, temples faint. Anterior margin of the labrum straight or faintly concave, bearing six setae. Anterior margin of the clypeus concave; clypeus laterally unisetose. Frontoclypeal suture slightly concave. Frons faintly transversally wrinkled. Supraorbital setation bilaterally unisetose. Disk impunctate with a faint isodiametric microreticulation. Antennae stocky, short, extending only to the basal fourth of the elytra. Antennal scape sub-oval-truncate, shorter than the eye's diameter, distinctly narrowed basally and slightly apically, with one dorsal seta; 2nd antennomere with one ventroapical seta, occasionally (in three specimens of the type series) with an additional dorsoapical seta. Penultimate labial palpomere trisetose.

Mentum medially deeply cut, between the two median teeth widely and semi-circularly incised (Fig. 2), the incision 2–2.5 times deeper than the outer incisions; the median incision clearly exceeds the virtual base line of the outer incisions (Fig. 3A). Median length of the mentum less than 0.50 of the total mental length. Median teeth with one seta. Submentum bilaterally with 2–3 setae.

Pronotum cordate, widest at apical third (Fig. 1); ratio width/length = 1.39 (1.33–1.43). Anterior angle acutely rounded, distinctly protruding. Lateral margin evenly rounded to the anterior and to the posterior angle with a distinct sinuation before the angles. Basal margin medially straight, laterally faintly curved. Posterior angles acutely protruding. Lateral explanation narrow, impunctate, laterally bordered. One midlateral seta present at widest point. Base narrower than apex (0.84 times). Basolateral seta present. Apical transverse impression weak, the basal one distinct. Transverse impressions impunctate; median longitudinal impression faint. Basal fovea shallow. Microreticulation isodiametric. Prosternal process unmarginated, rounded apically to a knobby bulge. Proepisternum smooth.

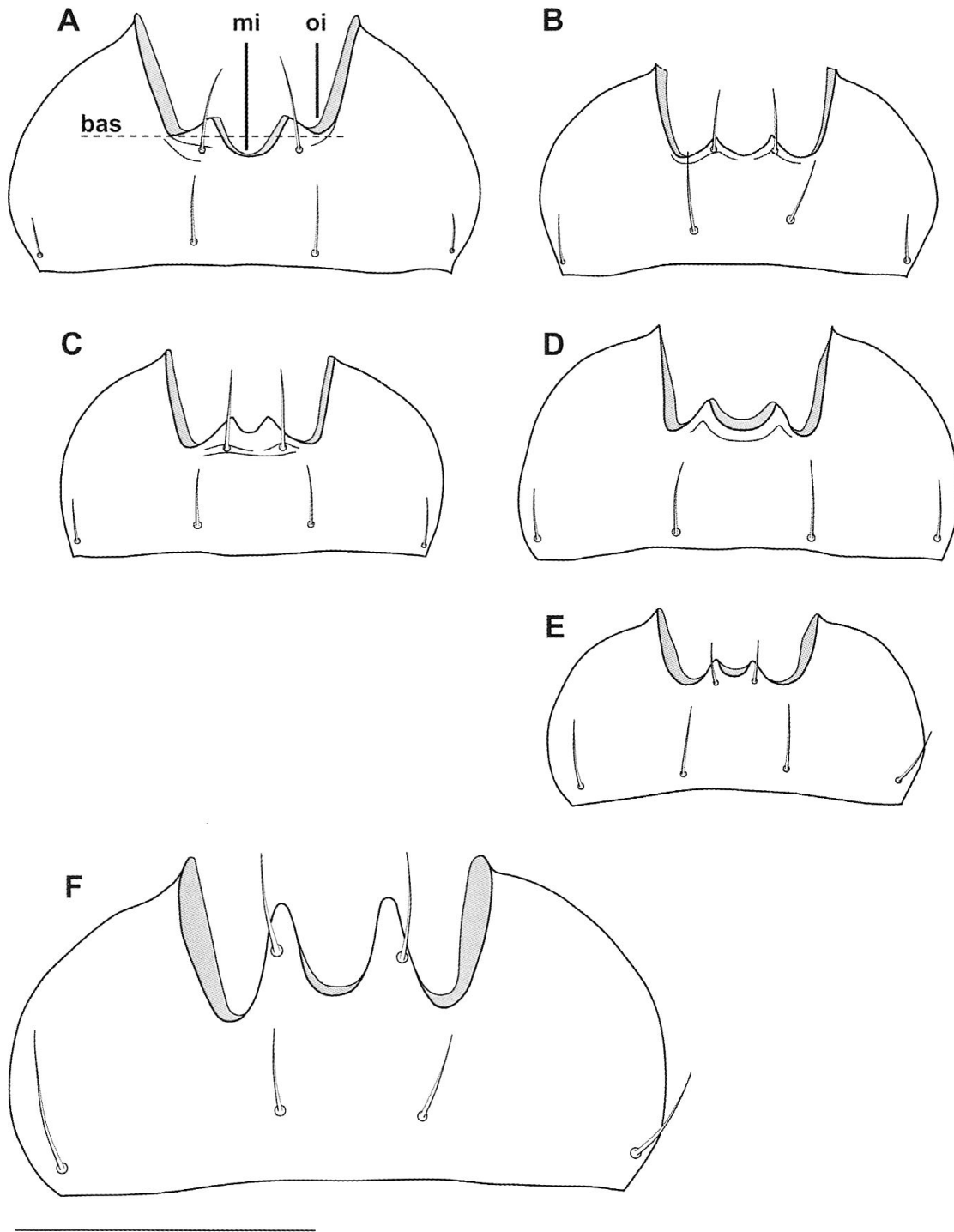


Fig. 3: Mentum. A) *Nebria (Asionebria) mentoincisa* sp. n. — B) *N. (Asionebria) orientalis* Bänninger, 1949. — C) *N. (Asionebria) pharina walteriana* Ledoux & Roux, 1997. — D) *N. (Asionebria) roborowskii* Semenov, 1889. — E) *N. (Asionebria) cf. unguinosa* Ledoux, Roux & Sciaky, 1994; — F) *N. (Eunebria) lewisi* Bates, 1874. bas = virtual base line (dashed) of outer incisions, mi = median incision, oi = outer incision. Scale = 1 mm.

Elytral silhouette oval-elongate. Elytral apex rounded. Basal margination faintly curved, joined at an obtuse angle with the lateral margination. Humeral carina absent. Apical carina absent. Striae shallow, faintly punctate or impunctate. Striae 1–3 reaching the apex, the other striae obliterate apically and laterally. Intervals on disk faintly convex, interval 3 asetose except for the apical seta. Scutellar seta absent. Microsculpture isodiametric. Mesepisterna smooth and impunctate. Metepisterna twice as long as wide, smooth and impunctate. Metacoxa usually basally bisetose (1–3 setae), apically unisetose. Hindwings reduced. 2nd sternum (sensu Ledoux & Roux 2005) laterally impunctate. 3rd abdominal sternum medially asetose. Sterna 4–6 each usually with one posterior paramedial seta (rarely with two setae). Anal sternum with one paramedial seta in the male and two setae in the female. All sterna with faint impressions laterally.

Legs long. All tarsomeres dorsally glabrous; tarsomeres stout, especially in male. Protarsomeres 1–4 in males broadened; only protarsomeres 1–2 ventrally with a tuft of adhesive hairs.

Aedeagus: Median lobe apically thickened (Fig. 4). Mid-shaft thin, narrowed directly after the small basal part, evenly curved to the apex. Apex acute, faintly deflected to the left.

Ecology: Alpine, stenohydrophilic, under stones along rivulets (Fig. 5). At one place (upper Tsubu side valley) the new species was found syntopic with *Nebria (Psilonebria) superna* Andrewes, 1923.

Distribution: Only known from the mountains on the south side of the Kurum Valley northwest of Lhasa (Fig. 6).

Etymology: The specific epithet refers to the low-cut mentum [incidere (Latin) = to incise].

Remarks: The wide and deep incision between the two median teeth of the mentum as an apomorphic character is unique within the subgenus *Asionebria* (Figs 3A–E). Within the subgenus *Eunebria* Jeannel, 1937 the two species *N. lewisi* Bates, 1874 (from Japan) and *N. yunnana* Bänninger, 1928 (from Yunnan and Sichuan/China) differ from the conventional (plesiomorphic) median dentation of the mentum by

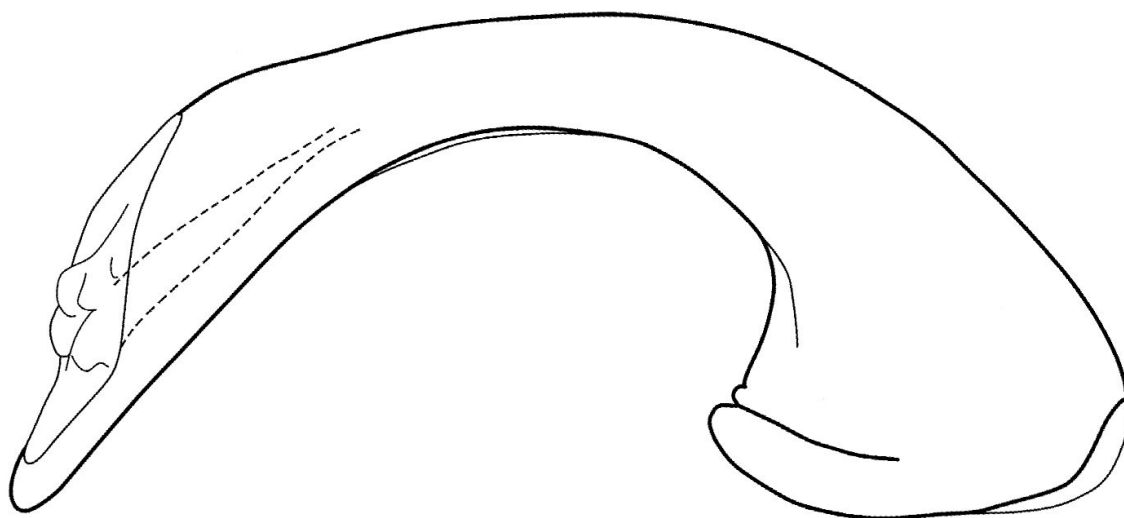


Fig. 4: Aedeagus of *Nebria (Asionebria) mentoincisa* sp. n. Scale = 1 mm.



Fig. 5: Habitat of *Nebria (Asionebria) mentoincisa* sp. n. in the uppermost part of the Namba side valley of Kurum Valley, Transhimalaya NW Lhasa, 5350 m NN. Mt. Nyainqentanglha Feng (7117 m NN) is seen in the background.

the apically lengthened and protruding teeth (Fig. 3F) in contrast to *N. mentoincisa* sp. n. where the median incision is pronounced. Although the subgenera *Eunebria* and *Asionebria* seem closely related (Ledoux & Roux 2005), these basic modifications of the incision of the mentum are probably convergent. In contrast, *N. mentoincisa* sp. n. has to be classified in the subgenus *Asionebria* due to its enlarged tarsi, the short antennae, and the enlarged antennal scape. These characters are considered here as synapomorphies of the species summarized in the *Asionebria* species group.

KEY

Step 1 of the determination key of the *Asionebria* species in Ledoux & Roux (2005) has to be modified:

- 1 Bicolored species, dark brown with elytra and pronotum yellowish bordered.
 - *N. pharina* Andrewes
 - *N. pharina walteriana* Ledoux & Roux
- Unicolored species; brown to blackish.1a
- 1a Mentum between the two median teeth with a deep semicircular incision, lower than the outer incisions, clearly cutting the virtual base line of the outer incisions. Tarsi stout. Protarsomeres 1–2 in male with a tuft of adhesive hairs. Body length 9.5–11 mm. *N. mentoincisa* sp. n.

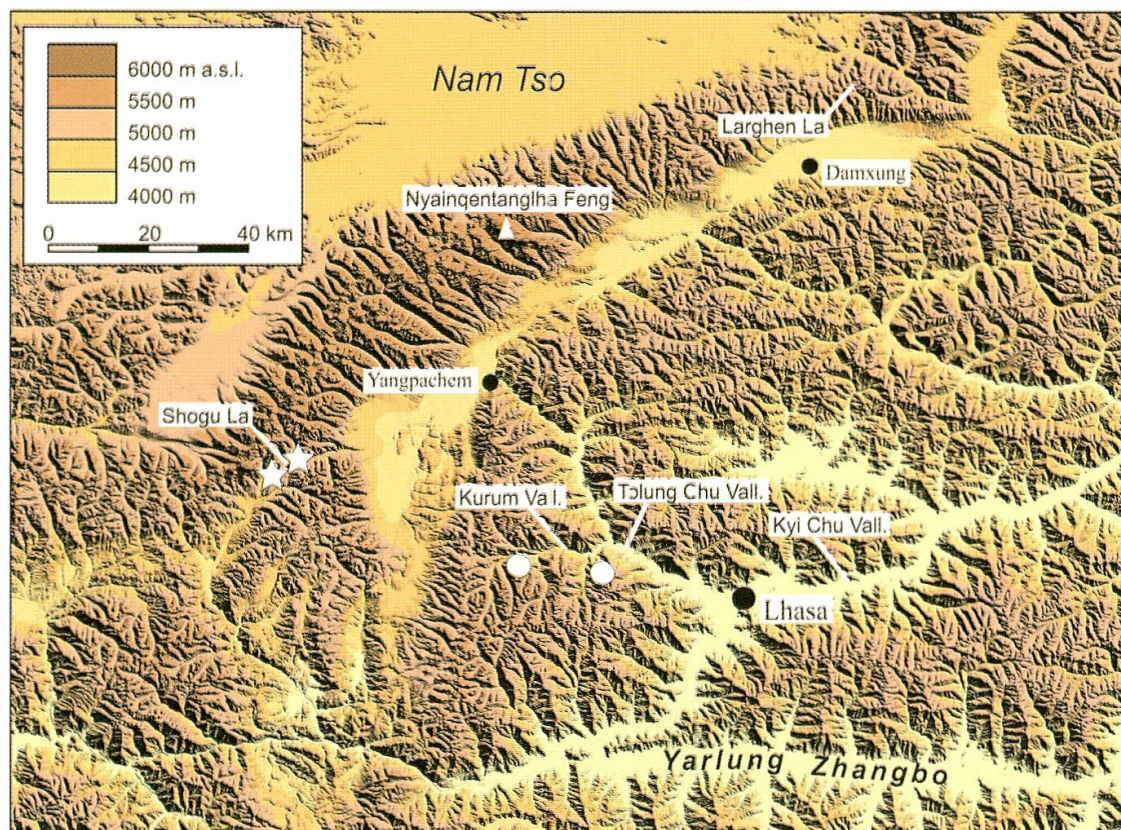


Fig. 6: Map of Southern Central Tibet showing the distribution of *Nebria (Asionebria) mentoincisa* sp. n. (Kurum Valley; dots) and *N. (Asionebria) pharina walteriana* Ledoux & Roux, 1997 (vicinity of pass Shogu La; stars).

- Mentum between the two median teeth little incised, less low than the outer incision, not cutting the virtual base line of the outer incisions. Tarsi slender. Protarsomeres 1–3 in male with a tuft of adhesive hairs. Body length < 10 mm. 2

ACKNOWLEDGEMENTS

We acknowledge the help of Franziska Schmid (ETHZ) for the loan of the type series of *N. orientalis* of the Bänninger collection. We gratefully acknowledge the help of Elsa Obrecht (NMBE) with the manuscript, and of Christiane Enderle (Marburg) for providing us the draft map for Fig. 6. The studies of the junior author were supported by the German Research Council (DFG grant MI 271/20-1).

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(received February 11, 2013; accepted April 30, 2013; published June 30, 2013)